OPERATIONAL RISK MANAGEMENT

User Training

User Training

- Deliberate ORM Process
- Hazard Identification Tools
- Hazard Assessment Tools
- Risk Assessment Tools

Operational Risk Management

Levels of Application

1. Time-critical - On the run consideration

2. Deliberate - Application of the Complete 5-Step Process

3. In-Depth - Complete 5-Step Process With Detailed Analysis

ORM Process
Deliberate ORM

1. Identify Hazards
- **A.** Operational Analysis
- **B.** Preliminary Hazard Analysis

2. Assess Hazards

3. Make Risk Decisions
- **A.** Control options
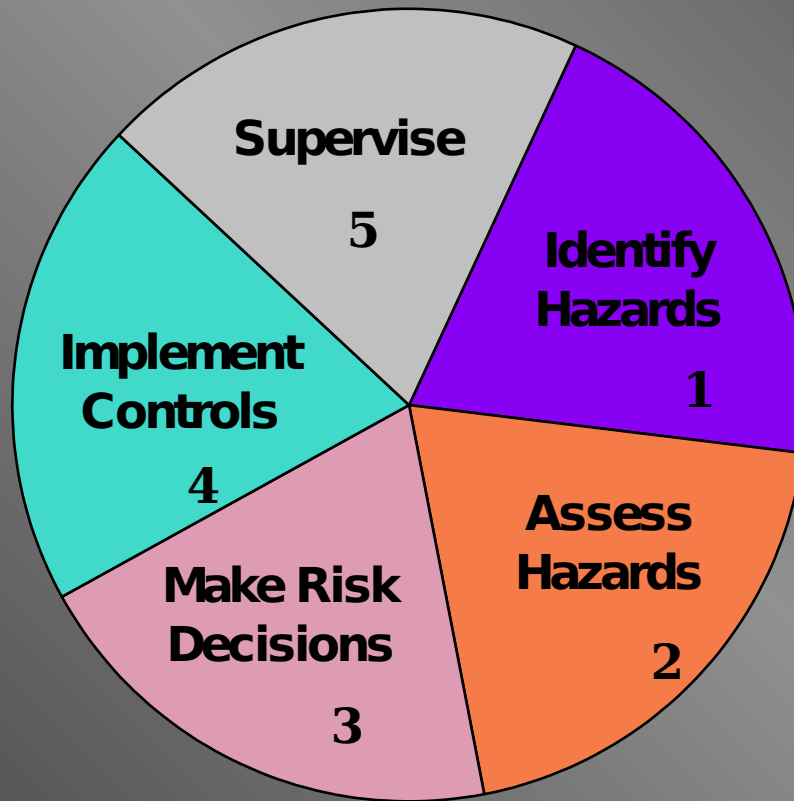- **B.** Risk vs. Benefit
- **C.** Communicate

4. Implement Controls

5. Supervise

ORM Process

1. Identify Hazards

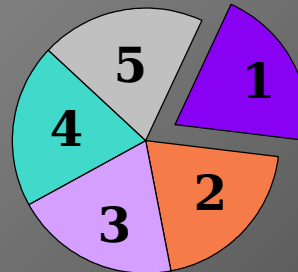A. Operational Analysis

B. Preliminary Hazard An

   (1) List Negative Events

   (2) List Hazards

   (3) List Possible Causes

Operational Analysis
Short Notice Deployment Preps

1. Review the accelerated pre-deployment

2. Consider integration of newly assigned

3. Review equipment/material requiremen

4. Plan stores requirements.

5. Review theater operating policies and p

6. Write/execute pre-deployment training

Analysis Reviewing Hazards Associated with an Accelerated Pre-deployment Schedule

| Neg Event:	Hazards:	Causes:
Misson Non-Accomp	Unrealistic schedule/goals	Comp
Mission Non-Accomp/ Inadequate Emerg Resp/ Drop in PRIMAR	Insufficient manning	PERS
Navigation Mishap	Non-avail of Nav Trainer	Assets
Drop in PRIMAR/ Weapons Incident/ Coll/Grounding	Insufficient proficiency	Lack o
Material Damage/ Injury	High stress levels	Rush

2. Assess Hazards

Prioritize Identified Hazards based on:

- **Severity of Possible Loss**

- **Probability of Possible L**
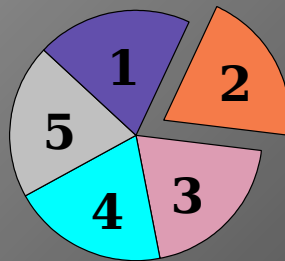
Hazard Assessment

Reviewing Hazards Associated with an Accelerated Pre-deployment Schedule

Hazard:	Severity	Probability	Pri
Unrealistic schedule/goals	H	M	
Insufficient manning	M	M	
Non-Avail of Nav Trainer	M	L	
Insufficient proficiency	H	H	
High stress levels	H	M	

3. Make Risk Decisions

A. Consider Risk Control Options

   (1) Most Serious Risks First

   (2) Refer to PHA Causes
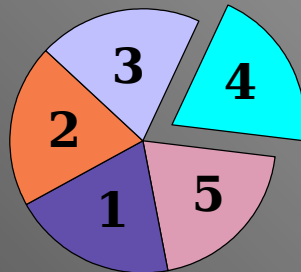
B. Risk vs. Benefit

C. Communicate as Required
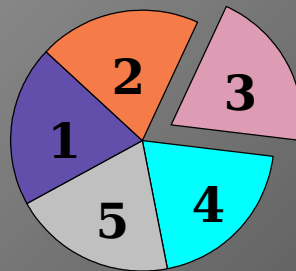
ORM Presentation Approaches

- Compare to Familiar Risks
- Total Losses Over Time
- Personal Impact
- Organizational Impact
- Cost Benefit

4. Implement Controls

- **Engineering Controls**

- **Administrative Controls**

- **Personal Protective Equip**

Controls
Accelerated Pre-deployment Schedule

1. Formal communication w/ COC regarding assets/ readiness/tasking.

2. Careful recruiting and screening of personnel to fill shortfalls.

3. Discuss possibility of off-hour training with Nav School.

4. Pursue goals of tailored proficiency vice common training
   package with ISIC and ATG.

5. Conduct thorough and complete briefs for every

5. Supervise

- **Monitor for Effectiveness of Controls**

- **Watch for Changes**
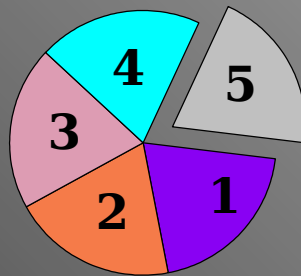
ORM Process
Deliberate ORM

1. Identify Hazards
   A. Operational Analysis
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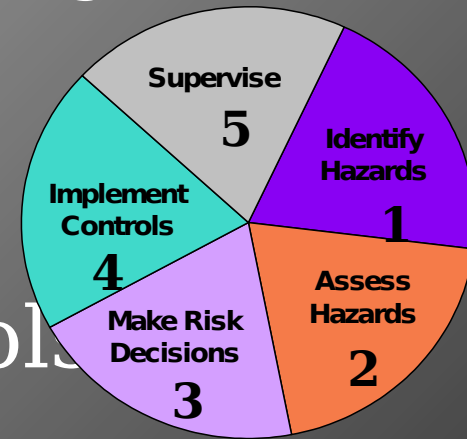
Deliberate ORM Demonstration

ORM Process

Deliberate ORM

1. **Identify Hazards**
     A. **Operational Analysis**
     B. **Preliminary Hazard Analysis**
2. Assess Hazards
3. Make Risk Decisions
     A. Control options
     B. Risk vs. Benefit
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Basic Hazard Identification Tools

- **Operational Analysis:**
  - **Flow Chart**
  - **Simultaneous Timed Events P__ing**
  - **Affinity Diagram**

- Preliminary Hazard Analysis:
  - Change Analysis
  - Brain Storming
  - "What-if" and Scenario Thinking

Flow Chart

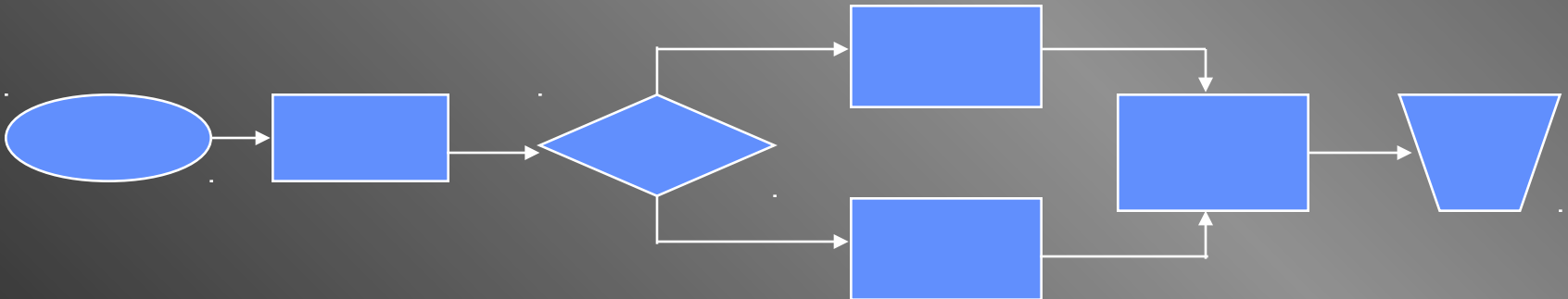- Technique designed to depict the steps of an operation/process

- Application: Operational analysis

- Methodology:
  - Define the steps of an operation/process
  - Depict the interaction of each step

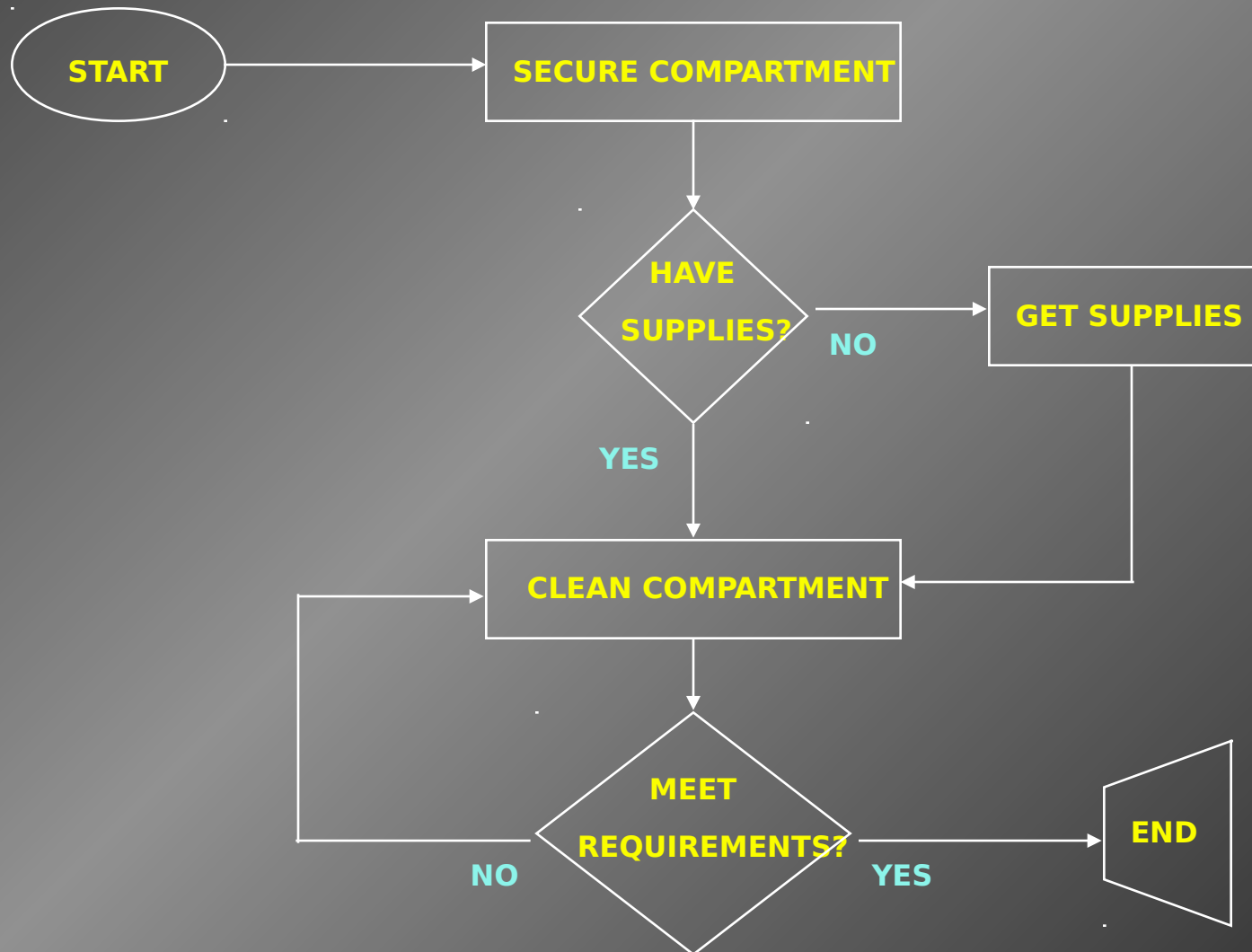**Start** **Activity** **Decision** **End**

Flow Chart
(Cont.)

- Promotes understanding
- Compares actual process with ideal process
- Reveals how steps relate to each other

Flow Chart
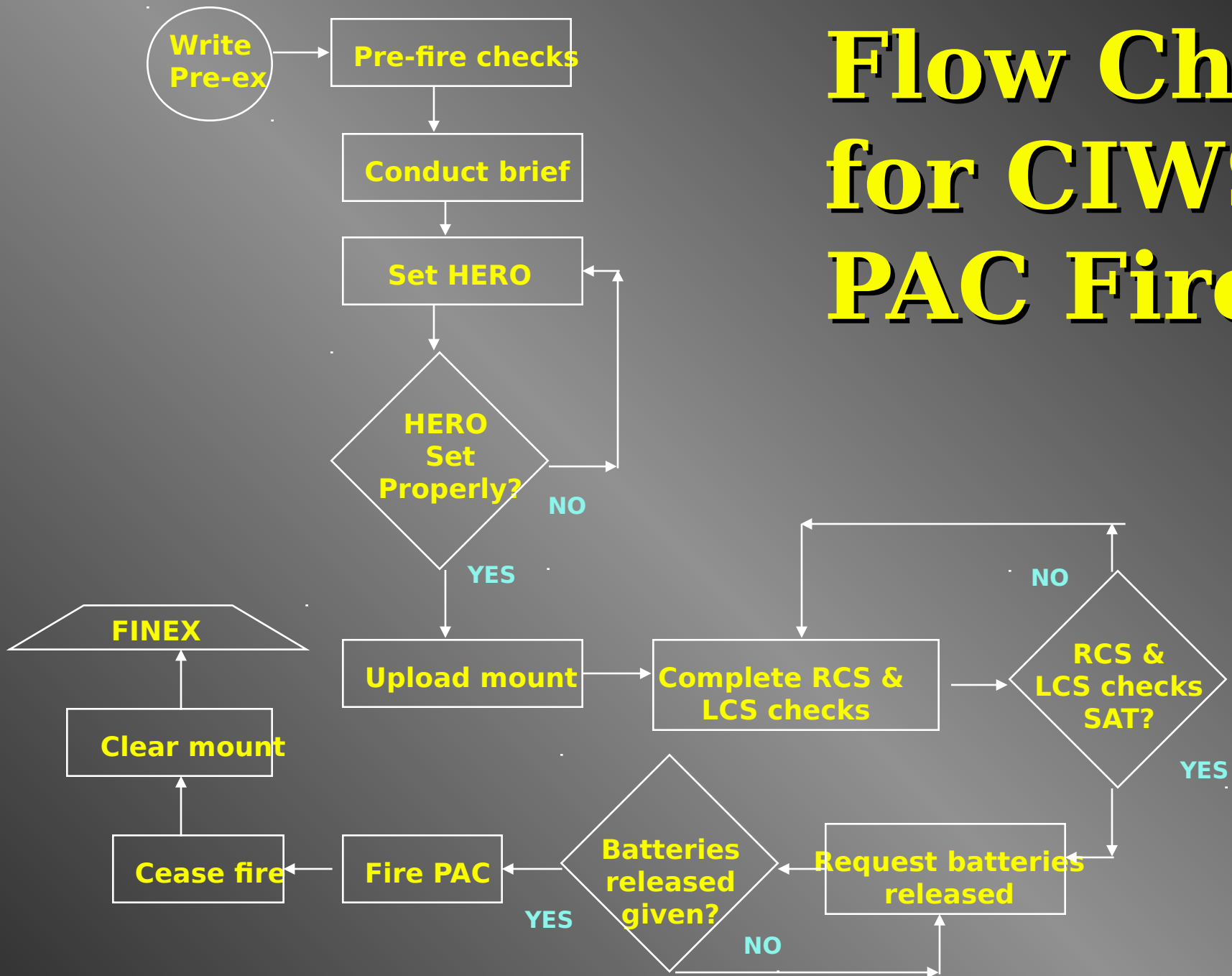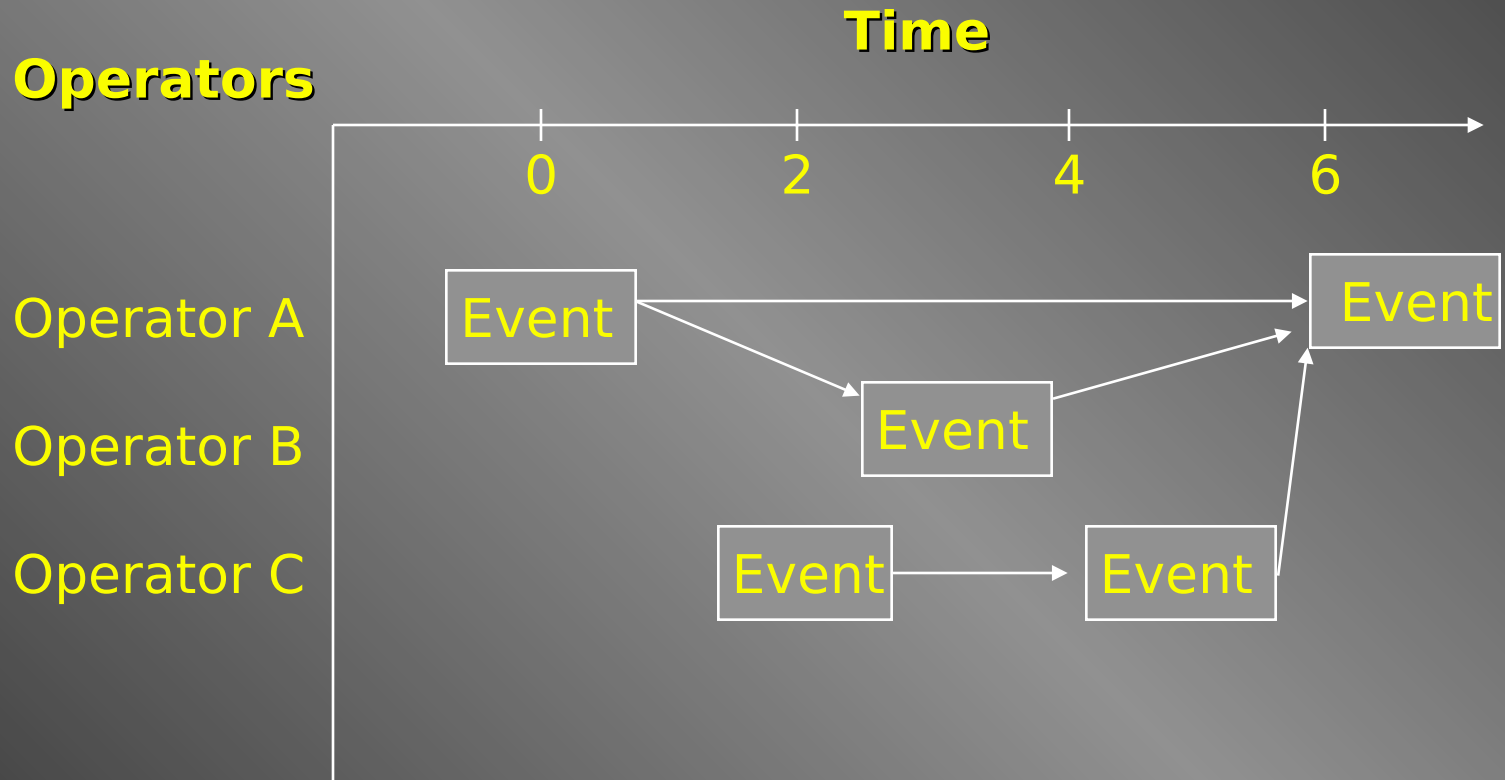## (Cont.)

Flow Chart for CIWS PAC Fire

```
Write Pre-ex → Pre-fire checks
                    ↓
              Conduct brief
                    ↓
               Set HERO ←──────────┐
                    ↓               │
            ┌───────────────┐       │
            │ HERO Set      │──NO───┘
            │ Properly?     │
            └───────────────┘
                    │
                   YES
                    ↓
              Upload mount → Complete RCS & LCS checks → ┌──────────────┐
                                        ↑                │ RCS & LCS    │──NO──┐
                                        └────────────────│ checks SAT?  │      │
                                                         └──────────────┘      │
                                                                │              │
                                                               YES             │
                                                                ↓              │
              Clear mount ← Cease fire ← Fire PAC ← ┌─────────────┐   Request batteries ←┘
                    ↑                       ↑        │ Batteries   │←─ released
                  FINEX                    YES       │ released    │        ↑
                                                     │ given?      │──NO────┘
                                                     └─────────────┘
```

FINEX

Write Pre-ex

Pre-fire checks

Conduct brief

Set HERO

HERO Set Properly?

NO

YES

Upload mount

Complete RCS & LCS checks

RCS & LCS checks SAT?

NO

YES

Clear mount

Cease fire

Fire PAC

Batteries released given?

YES

NO

Request batteries released

Simultaneously Timed Events Plotting (STEP)

- Technique used to chart "busy" operations in which several activities take place at or near the same time.

- **Application: Operational Analysis**

- Methodology:
  - Define the "operators"
  - Define the "events"
  - Diagram chronologically on timeline

Simultaneously Timed Events Plotting (STEP) (Cont.)

STEP (Cont.)
UNREP Station Maint

|	Week 1	Week 2	Week 3	Wee
Station 1 (Fuel)	[Replace spanwire]			
Station 2 (Fuel)		[-------HPU overhaul----------------]		
Station 3 (Cargo)				
Station 4 (Cargo)				[
Station 5 (Fuel)				
Station 6 (Fuel)		[RAM overhaul]		

Affinity Diagram

- Technique which partitions a problem or issue into categories to focus brainstorming on one aspect of the problem at a time.
- Application: Operational Analysis and Preliminary Hazard Analysis
- Methodology:
  - Define the issue
  - Separate the issue into phases/categories
  - Brainstorm within each category
  - Collect/Display ideas

Affinity Diagram
(Cont.)

- More complete analysis of large volumes of data
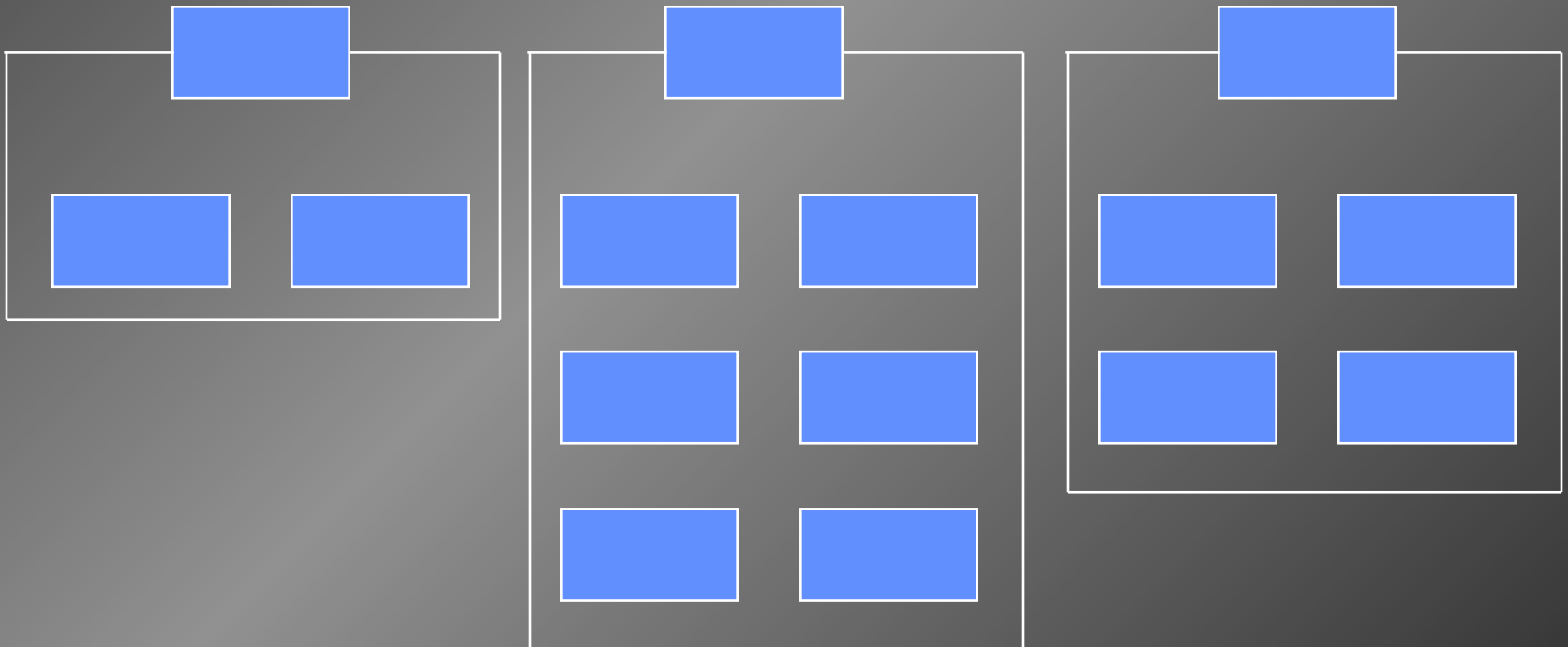
Affinity Diagram
(Cont.)

AN/SPA-25F Repeater Upgrade

Maintenance

Parts
SE/Test Equipment
Maintenance Manuals
Interface w/ other equip
QA

Training/Quals

Bridge/CIC Personnel
Maintenance &
   Test Procedures

Operations

Emergency procedur
Use in Navigation
Contact Tracking

Basic Hazard Identification Tools

- Operational Analysis:

  – Flow Chart
  – Simultaneous Timed Events P
  – Affinity Diagram

- **Preliminary Hazard Analysis:**

  – **Change Analysis**
  – **Brain Storming**
  – **"What-if" and Scenario Thinking**

Change Analysis

- Technique designed to identify hazards that arise from planned/unplanned change
- Applications:
  - Time critical ORM
  - Time-saving procedure for deliberate ORM
  - Investigative tool to detect changes that led to previous losses

Change Analysis
(Cont.)

- Methodology:

  – Review previous operation/current practices

  – Review Operational Analysis of planned   operation

  – For each step/phase of the operation, identify   differences ("changes") between the two

  – Determine impact on risk of the operation

Change Analysis
(Cont.)

Elements to Consider

WHO: Operator, Fellow worker/unit,   supervisor

WHAT: Equipment, Material, Energy

WHY: Trigger Event

WHERE: Environment

WHEN: Day/Night/Season, during operation, in personnel schedule

HOW: Procedures, controls

Change Analysis
(Cont.)

Navigation Detail into a New Foreign Port

- Environmental conditions expected
  - Weather/fog
  - Tides/currents/depths
- Competency and language skills of the pilots
- Mooring facilities and tugs
- Expected surface traffic
- Radio communications
- Navigational charts
  - Visual and radar points
  - Choke points/bridges/shoals

Brainstorming

- Technique which guides a group in exchanging/generating ideas
- Application: Preliminary Hazard Analysis
  - Separately
  - With other tools
- Methodology:
  - State question and time limit
  - Share and record ideas
  - Discuss ideas to ensure understanding

Brainstorming
(Cont.)

Guidelines

- Encourage active participation by all
- Develop a high-energy, enthusiastic climate
- Do not criticize or compliment ideas as they are presented
- Encourage creative thinking, including "out of the box" ideas
- Build and expand on the ideas of others
- Try to generate as long a list as possible within the allotted time

"What-if" Analysis

- Technique designed to visualize possible events or scenarios which could develop during an operation or process.

- Application: Preliminary Hazard Analysis
  - Separately
  - With other tools

"What-if" Analysis
(Cont.)

- Methodology:

  – Develop an Operational Analysis of the operation

  – Apply a series of "what if" questions to each step/phase of the operation

  – Record identified hazards and causes

  – Expand into Scenario thinking, if desired

Guidelines for Scenario Development

- Target length - 5 or 6 sentences, 60 words

- Include elements of man, machine, material and method

- Start with history, but sanitize

- Encourage imagination and intuition

- Carry scenario to the worst credible outcome

Scenario Example

- An amphibious landing will be conducted on the southwest coast of Spain during an exercise.
- **Initial reports from the Naval Liaison Officer (NLO) indicate that the exercise area is also a popular commercial fishing area.**

Scenario Example

- An amphibious landing will be conducted on the southwest coast of Spain during an exercise.
- Initial reports from the Naval Liaison Officer (NLO) indicate that the exercise area is also a popular commercial fishing area.
- **During this time of the year, fog is prevalent in the early morning hours.**

Scenario Example

- An amphibious landing will be conducted on the southwest coast of Spain during an exercise.
- Initial reports from the Naval Liaison Officer (NLO) indicate that the exercise area is also a popular commercial fishing area.
- During this time of the year, fog is prevalent in the early morning hours.
- **Previous experience shows that radar navigation in this area is only good to poor and may effect**

Basic Hazard Identification Tools

- ## Operational Analysis:

  - Flow Chart
  - STEP
  - Affinity Diagram

- ## Preliminary Hazard Analysis:

  - Change Analysis
  - Brain Storming
  - "What-if" and Scenario Thinking

ORM Process

Deliberate ORM

1. Identify Hazards
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Hazard Assessment Tools

Risk Assessment Mat

Probability

Severity		A	B	C	D
I		1	1	2	3
II		1	2	3	4
III		2	3	4	5
IV		3	4	5	5

Command Task Risk Assessment (Ranki
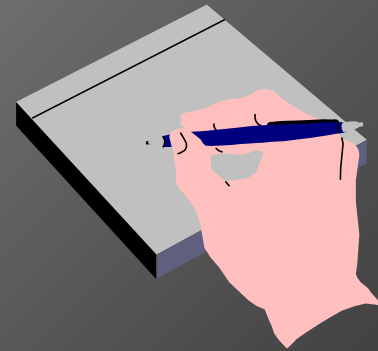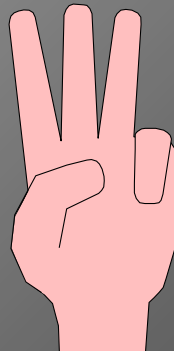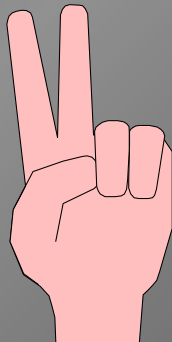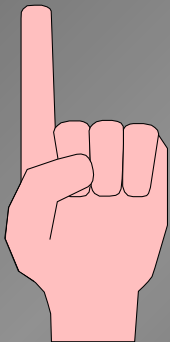
Risk Assessment Matrix

- Technique designed to assess the risk associated with a hazard, based on severity and probability

- Application: Any hazard assessment, including hazards identified by multiple sources.

- Methodology: For given hazard,

  - Estimate hazard severity

  - Estimate mishap probability

  - Assign Risk Assessment Code (RAC)

Risk Assessment Matrix (Cont.)

Mishap Probability

	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

Hazard Severity

Risk Assessment Matrix (Cont.)

- Subjective

- Less range than rankings

- Doesn't consider collective risk of multiple hazards

Risk Assessment Matrix (Cont.)

Reviewing Hazards Associated with Accelerated Pre-deployment Sched

	Severity	Probability	RAC
Unrealistic schedule/goals	II	C	3
Insufficient manning	II	B	2
Non-Avail of Nav Trainer	III	C	4
Insufficient proficiency	I	B	

Risk Assessment Matrix (Cont.)

Tailored RA Matrix

Probability (expected frequency) of Failure

Hazard Severity

	1/10	1/100	1/1000	1/10,000	1/100,000
I	1	2	4	8	12
II	3	5	6	10	15
III	7	9	11	14	17
IV	13	16	18	19	20

SSWG

Usage Rate (Probability)

Severity if out of stock

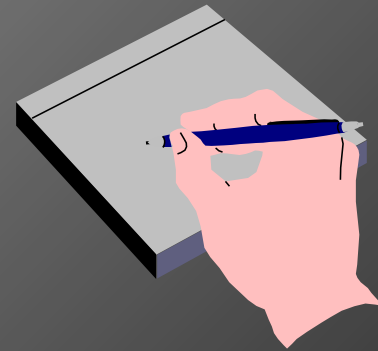|	10/wk	5/wk	2/wk
NMC	1	2	3
PMC	2	3	4
FMC	3	4	5

Supply planning

Hazard Assessment Tools

Risk Assessment Matrix

Probability

	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5

Severity

Command Task Risk Assessment (Ra

Command Task Risk Assessment (Ranking)

- Technique which uses ranking to prioritize hazards according to severity and probability

- Application: Relative assessment of hazards, especially suited to local command tasks

- Methodology:
  - Rank hazards in order of severity
  - Rank hazards in order of probabil
  - Add rankings for each hazard
  - Rank hazards by total

Command Task Risk Assessment

Hazard	Severity	Probability	Sum	Priority
A	3	1	4	1
B	1	4	5	2
C	4	2	6	3
D	2	5	7	4
E	5	3	8	5

Command Task Risk Assessment (Cont.)

- Entirely Relative
- Tendency to Minimize Low
                        Ranking

Hazards
- Re-ranking Required for
New   Hazards

Command Task Risk Assessment (Cont.)
Reviewing Hazards Associated wit
Accelerated Pre-deployment Sche

	Severity	Prob	Sum	
Unrealistic schedule/goals	4	3		
Insufficient manning	3	2		
Non-Avail of Nav Trainer	5	5		
Insufficient proficiency	1	1		
High stress levels	2	4		

Risk Assessment Tools

Identify Hazards and Assess their R

- Aviator RA Questionnaire
- Individual RA Questionnaires
  - On-duty
  - Off-duty/Leave
- Pre-flight/Scheduling RA Forms

Class Exercise

- **Deliberate ORM Practical Exe**